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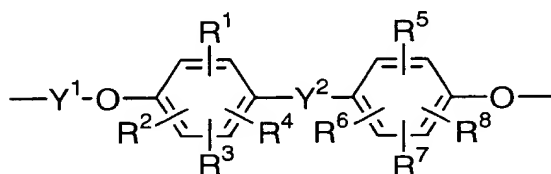
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WHAT IS CLAIMED IS:

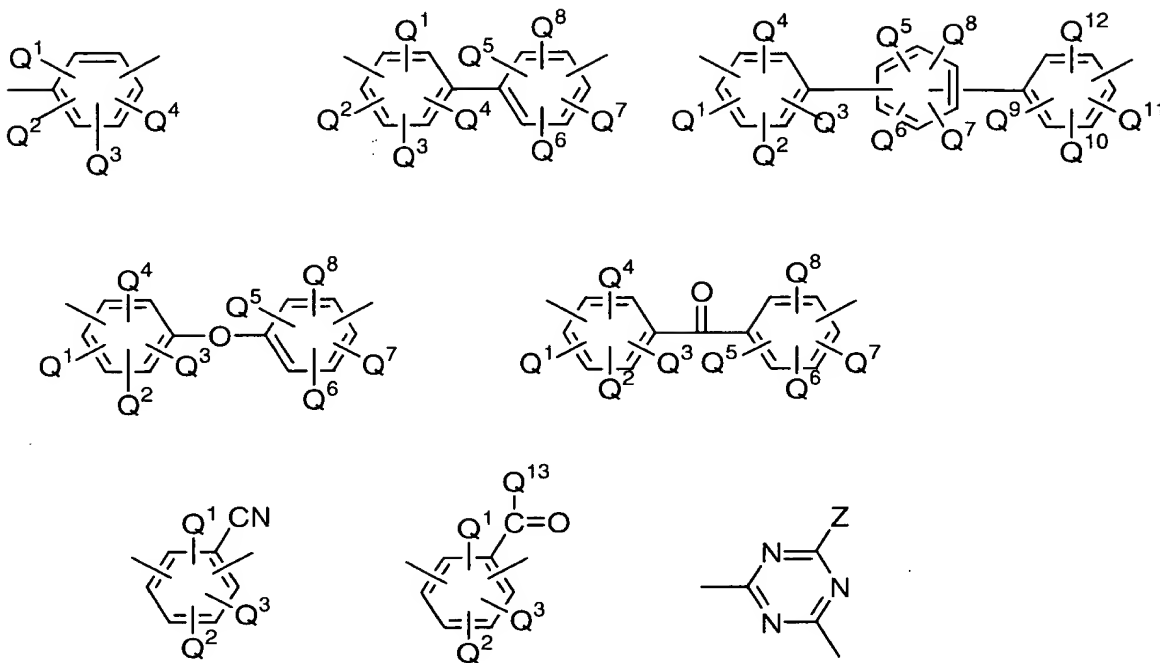
1. A polyether copolymer comprising (A) an aromatic polyether block and (B) an aliphatic polyether block.
2. The polyether copolymer according to claim 1, wherein (B) an aliphatic polyether block is on a side chain of (A) an aromatic polyether block.
3. The polyether copolymer according to claim 1, wherein the aromatic polyether block (A) has a structural unit represented by the following formula (1):



(1)

wherein R^1 , R^2 , R^3 , R^4 , R^5 , R^6 , R^7 and R^8 are independently selected from the group consisting of a hydrogen atom, a chlorine atom, an iodine atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, a cycloalkyl group having 4 to 10 carbon atoms, a methoxy group, an ethoxy group, a phenyl group which may be substituted and a functional group represented by the formula (2) or (3) described below; Y^1 is selected from any one of functional groups described below or two or more

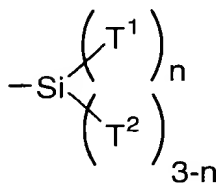
of the functional groups;



Y² is selected from any one of a single bond, a hydrocarbon group having 1 to 20 carbon atoms, an ether group, a ketone group and a sulfone group or two or more of them; at least one of R¹, R², R³, R⁴, R⁵, R⁶, R⁷ and R⁸ or Q¹, Q², Q³, Q⁴, Q⁵, Q⁶, Q⁷, Q⁸, Q⁹, Q¹⁰, Q¹¹, Q¹² and Q¹³ in at least one unit structure contained in a molecular chain is selected from functional groups represented by the formula (3);

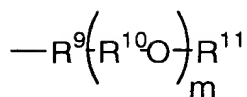
wherein Q¹, Q², Q³, Q⁴, Q⁵, Q⁶, Q⁷, Q⁸, Q⁹, Q¹⁰, Q¹¹ and Q¹² are independently selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2

to 10 carbon atoms and a functional group represented by the formula (2) or (3) described below; Q^{13} is selected from the group consisting of an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms and a functional group represented by the formula (2) or (3) described below; Z is selected from the group consisting of a hydrogen atom, a fluorine atom, a chlorine atom, a bromine atom, an iodine atom, a group $-OZ^1$ and a group $-NZ^2Z^3$; and Z^1 , Z^2 and Z^3 are independently selected from the group consisting of a hydrogen atom, a saturated or unsaturated hydrocarbon group and an ether bond-containing group;



(2)

wherein T^1 is selected from an alkenyl group having 2 to 10 carbon atoms; T^2 is selected from an alkyl group having 1 to 10 carbon atoms and an aryl group; n represents an integer of 1 to 3 inclusive; plural T^1 's may be different from each other and plural T^2 's may also be different from each other;



(3)

wherein R^9 is selected from a single bond and a hydrocarbon group having 1 to 10 carbon atoms; R^{10} is selected from a hydrocarbon group having 1 to 10 carbon atoms; R^{11} is selected from a hydrogen atom and a hydrocarbon group having 1 to 10 carbon atoms; and m is selected from an integer of 1 or more.

4. The polyether copolymer according to claim 3, wherein R^{10} is $-CH_2-CH_2-$, $-CH_2-CH(CH_3)-$ or $-CH(CH_3)-CH_2-$.

5. The polyether copolymer according to claim 1, wherein the relation between the thermal decomposition starting temperature T_a ($^{\circ}C$) of the aromatic polyether block (A) and the thermal decomposition starting temperature T_b ($^{\circ}C$) of the aliphatic polyether block (B) is represented by the formula:
 $T_a \geq (T_b + 40)$.

6. A process for producing a polyether copolymer according to claim 1, wherein the process comprises reacting a bisphenol compound corresponding to the material for a moiety of the aromatic polyether block (A), a di-halogenated compound and an aliphatic polyether having an OH group at the terminal and corresponding to the material for a moiety of the aliphatic polyether block (B) in the presence of an alkali.

7. The process according to claim 6, wherein a pre-reaction

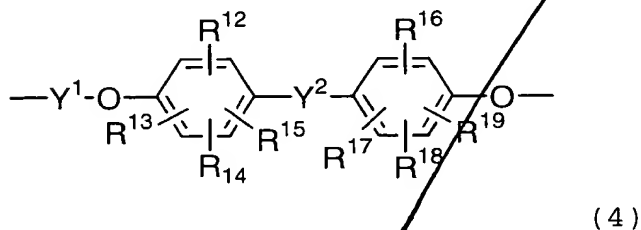
of the di-halogenated compound and the aliphatic polyether having an OH group at the terminal is carried out in the presence of an alkali, then the bisphenol compound and the di-halogenated compound are added to the reaction mixture and the reaction is continued in the presence of an alkali.

8. A process according to claim 1, wherein the process comprises steps of metallizing an aromatic polyether corresponding to a moiety of (A), and carrying out a substitution reaction with a halide of an aliphatic polyether corresponding to a moiety of (B).

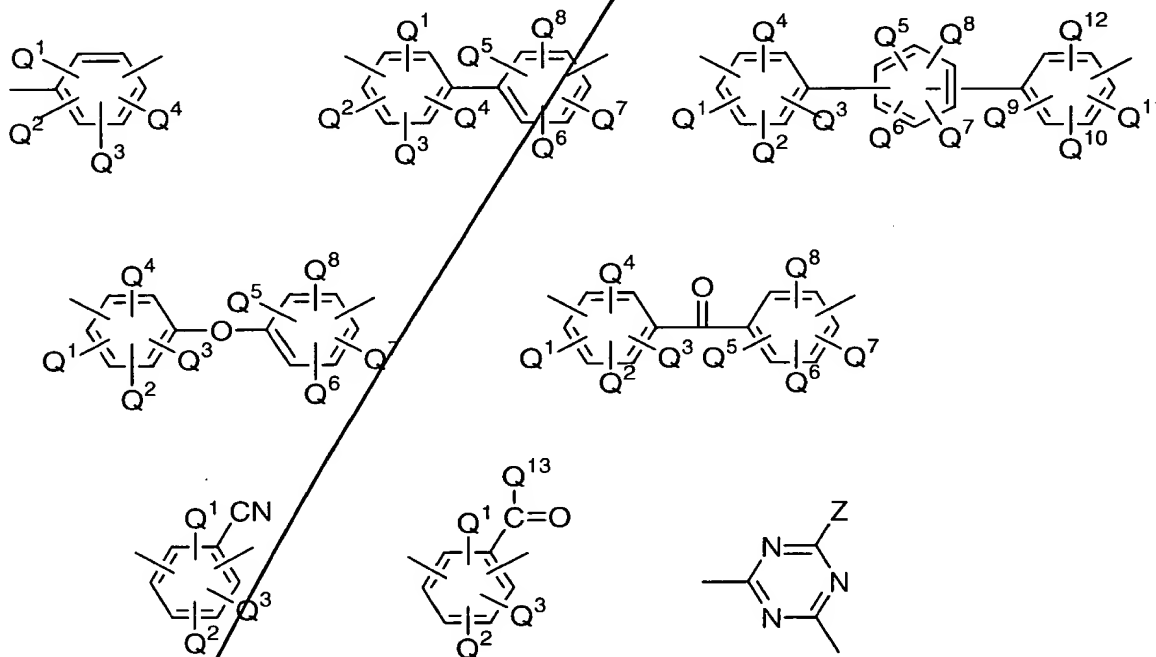
9. A coating solution for forming a porous organic film comprising (a) a polyether copolymer according to claim 1 and (b) an organic solvent.

10. A coating solution for forming a porous organic film comprising (c) a resin having a thermosetting functional group, in addition to (a) and (b) according to claim 9.

11. The coating solution according to claim 10, wherein the resin having a thermosetting functional group (c) has a unit structure represented by the following formula (4):



wherein R^{12} , R^{13} , R^{14} , R^{15} , R^{16} , R^{17} , R^{18} and R^{19} are independently selected from the group consisting of a hydrogen atom, a chlorine atom, an iodine atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms, a cycloalkyl group having 4 to 10 carbon atoms, a methoxy group, an ethoxy group, a phenyl group which may be substituted and a functional group represented by the formula (2) described above; Y^1 is selected from any one of functional groups described below or two or more of the functional groups;



Y^2 is selected from any one of a single bond, a hydrocarbon group having 1 to 20 carbon atoms, an ether group, a ketone

group and a sulfone group or two or more of them; at least one of R^{12} , R^{13} , R^{14} , R^{15} , R^{16} , R^{17} , R^{18} and R^{19} or Q^1 , Q^2 , Q^3 , Q^4 , Q^5 , Q^6 , Q^7 , Q^8 , Q^9 , Q^{10} , Q^{11} , Q^{12} and Q^{13} in at least one unit structure contained in a molecular chain is selected from an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms and a functional group represented by the formula (2) described above;

wherein Q^{14} , Q^{15} , Q^{16} , Q^{17} , Q^{18} , Q^{19} , Q^{20} , Q^{21} , Q^{22} , Q^{23} , Q^{24} and Q^{25} are independently selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms and a functional groups represented by the formula (2) described above; Q^{26} is selected from the group consisting of an alkyl group having 1 to 10 carbon atoms, an alkenyl group having 2 to 10 carbon atoms, an alkynyl group having 2 to 10 carbon atoms and a functional group represented by the formula (2) described above; and Z , Z^1 , Z^2 and Z^3 have the same meaning as described claim 3.

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12. The coating solution according to claim 10, wherein the thermal curing reaction starting temperature T_c of the resin having a thermosetting functional group (c) is less than the thermal decomposition starting temperature T_b of the aliphatic polyether block (B).

13. The coating solution according to claim 9, wherein the organic solvent (b) comprises a solvent having an aromatic

ring in its molecule and having a boiling point of 250°C or below.

14. The coating solution according to claim 9, wherein the organic solvent (b) comprises at least one selected from the group consisting of anisole, phenetole and dimethoxybenzene.

15. A process for forming a porous organic film, wherein the process comprises coating a substrate with a coating solution for forming a porous organic film according to claim 9, and carrying out a heat treatment to generate a void at a temperature of not less than the thermal decomposition starting temperature T_b of an aliphatic polyether block and at a temperature of less than the thermal decomposition starting temperature T_a of an aromatic polyether block.

16. A process for forming a porous organic film, wherein the process comprises coating a substrate with a coating solution for forming a porous organic film according to claim 10, then thermally curing the film at a temperature of not less than the thermal curing reaction starting temperature T_c of a resin having a thermosetting functional group and at a temperature of less than the thermal decomposition starting temperature T_b of an aliphatic polyether block, and carrying out a heat treatment to generate a void at a temperature of not less than the thermal decomposition starting temperature T_b of an aliphatic polyether block and at a temperature of less than

the thermal decomposition starting temperature T_a of an aromatic polyether block.

[illegible]